PREHOSPITAL CARE

A survey of trauma alert criteria and handover practice in England and Wales

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Introduction: Appropriate alerting of patients with trauma and informative handover are necessary to allow a smooth transition of care between the prehospital and hospital teams.
Aim: To identify current practice and areas that need to be improved to facilitate the transition from prehospital care to emergency department resuscitation.
Methods: A questionnaire postal study of 100 emergency departments and all 32 ambulance service trusts in England and Wales.
Results: Emergency departments returned 34 (34%) completed questionnaires, and ambulance trusts returned 16 (50%) completed questionnaires. In all, 56.8% of emergency department responders stated that trauma alert information was relayed through ambulance control, 48.5% stated that alert messages were standardised and 18.5% felt that ambulance crews used the trauma severity scoring system during alerting. 64.7% stated that handover was broadcast to the trauma team and 9.1% routinely received digital photographic images. All ambulance service responders included injury mechanism in their alerting criteria and 53.3% used a standard handover structure with 86.7% familiar with the mnemonic ASHICE (Age, Sex, History, Injuries, Condition, Expected time of arrival) for rapid information transmission.
Discussion: Greater cooperation between regional emergency departments and ambulance services is necessary to refine the alerting and handover process, producing a pathway through which vital information is collected by trained personnel and communicated without distortion to the resuscitation room, where it may be utilised to inform life-saving decisions.

The multidisciplinary trauma team provides immediate specialist knowledge and practical skills to selected patients with life-threatening injuries, representing a costly hospital resource. Activation criteria to exclude patients who would be equally well managed without the trauma team are therefore necessary to ensure appropriate utilisation. In many centres receiving severely injured patients, trauma alerts and trauma team activation are at the request of the ambulance crew or are dictated by locally agreed criteria based on physiological parameters and mechanism of injury. This vital information provided from the scene may directly influence immediate diagnostic and management decisions in hospital, and is relayed by paramedics who generally have infrequent exposure to patients with major trauma and who do not always receive routine formal training in trauma alerting and handover technique.[1]

This study aims to identify areas of current trauma alerting and handover practice that need to be improved to facilitate the transition from prehospital care to emergency department resuscitation.

METHOD

A postal questionnaire was sent to 100 accident and emergency departments seeing over 50 000 patients/year selected by random number generation from the British Association of Accident and Emergency Medicine Handbook,[2] to determine current and desired trauma alert and handover practice by ambulance paramedics. A second postal questionnaire was sent to the director of operations of all 32 ambulance services in England and Wales, addressing alert message content, alerting protocols and communication modality for land and air ambulances. A 3-month duration was permitted for response, and no reminders were sent.

RESULTS

In all, 34 (34%) completed questionnaires were received from hospital emergency departments and 16 (50%) were returned from the ambulance service trusts. The results are summarised in tables 1 and 2.

DISCUSSION

Numerous scoring systems have been proposed for application by paramedics to identify patients who would benefit from the presence of a trauma team on arrival to the emergency department. Previously described scoring systems and guidelines—for example, the prehospital Revised Trauma Score, Circulation, Respiration, Abdomen, Motor, Speech Scale and the American College of Surgeons triage decision scheme—are unable to reliably identify this patient group, and in this study only 26.7% of ambulance service responders acknowledged using a trauma scoring or coding system during alert calls to quantify injury severity.[3–5] A study of trauma alerting at a large English emergency department concluded that the majority of patients with major trauma (Injury Severity Score over 15) were not alerted by the ambulance service, and that 75% of patients alerted did not meet the Trauma Audit Research Network inclusion criteria for major trauma.[6] Trauma alert criteria, scoring systems and patient assessment schemes aim to identify all patients who will require immediate trauma team care. However, a necessary failing of any such system is overtriage, with the inclusion of a small number of patients who subsequently do not benefit from the more intensive service of a trauma team and also fail to meet the Trauma Audit Research Network criteria for major trauma.

In this study, the decision to declare a trauma alert and activate the trauma team demonstrated two main trends, with 15 out of 34 (44.1%) centres providing clear criteria for trauma

Table 1 Emergency department responder

Question	Response (%)
Does the land ambulance service use a standard alert message content for incoming trauma alerts?	Y = 48.5, N = 51.5
Does the structure and content of alert messages received from land and air ambulance crews differ?	Y = 18.2, N = 57.6 N/A = 24.2
What is the most frequent mode of communication used by the land ambulance service?	Control: 56.8, radio: 16.2, landline: 13.5, mobile telephone: 13.5
Do you alert the trauma team based on the mechanism of injury provided by the ambulance service?	Y = 66.7, N = 33.3
Are you familiar with MIST and ASHICE mnemonics for rapid transmission of alerting/handover information?	MIST Y = 27.3, N = 72.7 ASHICE Y = 45.5, N = 54.5
Does the ambulance service use a coding or scoring system for the severity of trauma?	Y = 18.5, N = 81.5
Does the ambulance service use a standard structure for handover of trauma alert patients?	Land ambulance: Y = 39.4, N = 60.6 Air ambulance: Y = 40.6, N = 43.8 N/A: 15.6
Is handover by pre-hospital staff typically:	Broadcast to team? 64.7 Direct to leader? 35.3
Do you routinely receive digital photographic information from scene in trauma alert handover?	Y = 9.1, N = 90.9
Would you find it beneficial to routinely receive digital photographic images in the trauma alert handover?	Y = 75, N = 25

ASHICE, Age, Sex, History, Injuries, Condition, Expected time of arrival; MIST, mechanism of injury, injuries sustained, symptoms and signs, treatments given; N/A, not applicable.

Table 2 Ambulance service responders

Statement	Response (%)
Is mechanism of injury part of your standard alerting criteria for trauma?	Y = 100, N = 0
Do you use a standard alert message content for alerting hospitals of incoming trauma?	Y = 62.5, N = 37.5
Do the alert criteria for helicopter responders differ from those used for land ambulances responding to trauma?	Y = 21.4, N = 78.6
Are you familiar with the MIST and ASHICE mnemonics for the rapid transmission of alerting/handover information?	MIST: Y = 15.4, N = 84.6 ASHICE: Y = 86.7, N = 13.3
Do you have any coding or scoring system for the severity of the trauma emergency?	Y = 26.7, N = 73.3
Do you use a standard structure for your handover of a trauma alert patient to the hospital trauma team?	Y = 53.3, N = 46.7
Do you routinely provide digital photographic images from scene?	Y = 12.5, N = 87.5

ASHICE, Age, Sex, History, Injuries, Condition, Expected time of arrival; MIST, mechanism of injury, injuries sustained, symptoms and signs, treatments given.

alerts, the contents of which showed considerable variation, and 13 out of 34 (38.2%) centres alerted on request by the ambulance crew. All ambulance service responders and 66.7% of hospital responders reported that trauma alerts were indicated on the basis of the mechanism of injury, but this information is not always available to the hospital trauma team. One responder stated that ''the ambulance crew carefully relay vitals but give much less attention to exactly what details were given to them by witnesses and what they observed at scene'', a problem that has been highlighted previously.[7] Only 9.1% of ambulance personnel responders routinely provided digital photographic images, although 75% of hospital responders believed that these images would be beneficial, providing information that can lead clinicians to suspect occult life-threatening injuries and greatly assist the provision of appropriate care.

In all, 21 (56.8%) alert calls from land ambulances were received via ambulance control, prohibiting two-way communication between hospital and scene, and preventing hospital staff from requesting further key information. The mode of communication was directly criticised by five centres, with one responder stating that ''occasionally the message from control bears no relation to the patient''. Several centres were critical of the information content transmitted during the alerting process, with one centre stating that ''the only time we receive information from scene is when we send out a team equipped with our mobile phone'' and a second centre reporting that ''the standard of information reaching our department is universally poor''. Despite criticism of information provision by the ambulance service, 86.7% of ambulance service responders stated that they are familiar with the acronym ASCHICE (Age, Sex, History, Injuries, Condition, Expected time of arrival) for the rapid transmission of alerting information to the receiving centre.

A total of 22 (64.7%) emergency department responders stated that handover by prehospital personnel was broadcast to the trauma team, providing all involved in the initial resuscitation information that facilitates early diagnosis and management of life-threatening injuries. Only 39.4% of emergency department responders felt that handover by land ambulance crew generally had a standardised structure, in contrast with the 53.3% of ambulance service responders stating that paramedics practised a standardised handover structure. A recent study reported that 19.4% of ambulance staff received formal handover training and 83% of the remainder desired further training, an implementation that this study supports.[1]

The placement of appropriate trauma alert calls by ambulance paramedics and the transmission of the right information to the activated trauma teams is extremely challenging when simultaneously transferring severely injured unstable patients from scene. Two-way communication between the receiving hospital and the paramedics in addition to trauma alert and handover protocols, reinforced by formal training, would help to improve the coordination between pre-hospital and hospital teams. Although limited by sample size, this study has identified areas of trauma practice that require refinement. The data collected is a random snapshot of current practice, and is representative of the large emergency departments and regional ambulance services that completed the questionnaire, which might have been increased further by sending a reminder to non-responders.

The criteria that indicate involvement of the trauma team for resuscitation of severely injured patients remain highly variable across England and Wales, and valuable information from

scene may fail to reach the hospital resuscitation team because of inadequate collection, loss through third-party transmission and incomplete handover. A universal protocol developed by national collaboration between emergency departments and ambulance service trusts, which could potentially be coordinated by the Joint Royal Colleges Ambulance Liaison Committee, has been suggested. This should aim to implement appropriate alerting protocols and devise a communication pathway through which vital information is rapidly collected and transmitted from scene, and presented to resuscitation team members in a practised standardised handover format.

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